By MURRAY BROWN

Depreciation and Corporate Profits

In connection with an interdepartmental study of economic growth, the Office of Business Economics is assessing trends in the division of corporate income between wages and profits. As a background to other parts of this project, the present article examines for the period 1929–62 the effects on corporate profits of alternative methods of calculating depreciation charges.

The present article is entirely descriptive. Its sole objective is to examine to what extent alternative methods of depreciation accounting modify the observed movement of corporate profits as measured for national income purposes over the postwar period and as compared with 1929. The article does not attempt to establish whether that movement can be called a long-term trend or whether it reflects more transitory factors. No examination is made of the basic determinants of profits such as the supply of labor and capital, the degree of competition, technological change, the extent of capacity utilization, or money and credit.

Nor does the article deal with the possible effects of the historical profits patterns on other aspects of the economy—e.g., on the course of prices, on investment incentives, corporate cash flows, or the further effects of these on the functioning of the economy or its various parts.

It will be noted also that in this study corporate profits are related to the value of corporate output as a standard. An alternative approach, which would relate them to invested capital, was not pursued. This alternative approach is of equal significance and necessary to a comprehensive evaluation of profit trends, but the data necessary to pursue it from the vantage point of this article are not available. However, judging from partial studies that have been made in the past, it is quite possible that the results would differ substantially if the focus of this study were the relation of profits to invested capital rather than to output.

Depreciation charges are intended to measure the decline in the value of productive facilities as a result of their use in production, their age, and their obsolescence. The last, in turn, results from the introduction of new methods of production or products, or from changes in demand. These charges are deducted from gross receipts along with other expenses to arrive at the profits for the accounting period.

The depreciation charges calculated for tax purposes, which underlie the present national income accounts, are based upon Federal tax laws and regulations and influenced by changes in them. While measures of this type are appropriate for some types of economic analysis, for many other purposes it is desirable to have depreciation and profit series that are not affected by such changes.

Even after we adjust for changes in the tax laws and their administration, the calculation of depreciation, and consequently of profits, remains subject to a number of unresolved questions. First, there is no general agreement about the way in which depreciation charges should be spread over the service life of a capital asset; second, there are several ways of measuring the value of the total capital that is to be depreciated; and, third, in a dynamic economy such as ours it is very difficult to assess the length of the service life over which the depreciation of the capital goods occurs.

Given these uncertainties, it is not possible to calculate depreciation and profit series to which there would be general consent. But it is possible to calculate several series, each based upon reasonable alternative assumptions as to depreciation formula, valuation, and service life. Then, from a comparison of the results so obtained, certain conclusions can be drawn as to the effect the different depreciation assumptions would have had on the level and movement of corporate profits. This is the approach adopted in the present article. The techniques of calculating the several corporate profit variants are explained in the appendix. The several profits series calculated are those that result when depreciation series based on alternative accounting methods are substituted for those used for tax purposes. These profits series need not be identical with those that would have materialized if these depreciation methods had actually been used by corporate management, because use of such methods might have led to different price, production, etc. policies, and therefore also of profits.

It should be noted that the alternative profits series are not part of the regularly published national income and product accounts. The reason for not incorporating them in these accounts is twofold. First, there is the lack of agreement on a single appropriate series just referred to. Second, the present estimates of alternative profit variants are preliminary and aggregative, and would have to be refined further before any of them can be considered for inclusion.

The discussion is arranged as follows: The pattern of the corporate profits component of the national income accounts, which is based on accounting practices used for tax purposes, is first reviewed. Corporate profits, before depreciation charges have been netted out, are then examined. Next, a version of corporate profits is introduced which adjusts for variations in tax laws and regulations. As will be explained,

this is based on depreciation charges calculated on a straight line historical cost basis. Subsequently, further profit variants are introduced, involving, in turn, departures from the straight line formula, from the historical cost method of valuation, and, finally, from the service lives that underlie the tax calculations of depreciation.

A major conclusion of the comparisons of these profit series is that all of them display a pattern similar to that of the national income variant: They decline relative to corporate gross product from the earlier part of the postwar period to 1962, and also for the longer span, 1929–62. However, the national income variant shows the largest relative decline. The study also shows that the recent level of corporate profits based upon national income concepts is in the lower range of the levels that would be registered if alternative reasonable methods of depreciation were used. These conclusions can be observed in table 1, and in the charts.

It would have been most desirable to extend the long-term comparison to years earlier than 1929, but the data necessary to do so are not available. From the partial information that is at hand,[1] it seems likely that if an average of prosperous years in the second half of the 1920's were substituted for 1929, the conclusion just summarized relating to the pattern of the profit share would continue to hold. It would not, however, seem to hold in a comparison made with the earlier part of that decade.

Corporate profits, national income version

Business earnings before taxes originating in the corporate system, as measured in the national income accounts, rose from $9.9 billion in 1929 to $44.4 billion in 1962, an average annual rate of increase of 4.7 percent. The annual growth rate in earnings slowed to 2.9 percent from 1948 to 1962. The pattern of the postwar decline in the rate of growth of earnings would have been substantially unaltered had periods of high activity in 1959 or 1960, been used as the terminal point of the comparison.

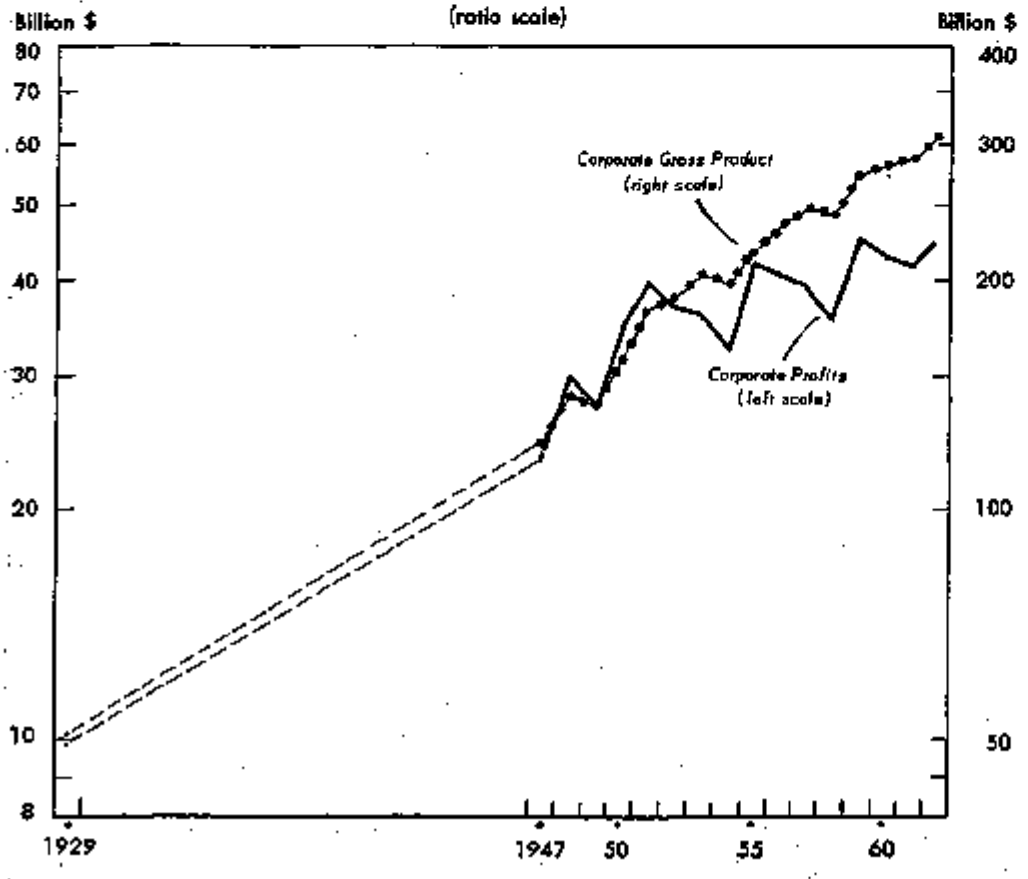
The corporate earnings measure discussed here is the same as the corporate profits component of the national income accounts, except that dividends and branch profits received by U.S. residents from abroad are omitted, while those remitted from the United States to foreign stock holders are included. The series excludes inventory gains and losses, capital gains and losses, and intercorporate dividends from profits of domestic corporations. The discussion is conducted in terms of a before-tax definition of profits, but for those who wish to examine the after-tax profits patterns, the data are provided in tables 3 and 4. It may be mentioned here that the conclusions noted above as to the broad patterns displayed by the various before-tax profits series hold also on an after-tax basis.

Corporate earnings may be compared with total corporate gross product, the corporate component of GNP. Corporate gross product is the market value of the output of goods and services originating in the corporate sector of the economy, net of intermediate products used up in production. Another meaningful comparison of corporate earnings would be with total income originating in corporate business. This is the sum of corporate earnings, employee compensation, and net interest. It differs from corporate gross product, which in addition includes depreciation charges, indirect business taxes, and a few minor items. Comparisons with corporate gross product are presented in tables 1 to 3 in this report; comparisons with corporate income originating are shown in table 4. The conclusions as to major trends are substantially the same whether income originating or corporate gross product is used as a

1. Harlow D. Osborne and Joseph B. Epstein, "Corporate Profits Since World War II," SURVEY OF CURRENT BUSINESS, January 1956.

CORPORATE GROSS PRODUCT AND PROFITS
NATIONAL INCOME ACCOUNTS

Corporate Profits Before Taxes* Have Declined in Relation to Corporate Output



* Including corporate inventory valuation adjustment and excluding corporate profits originating in rest of the world

frame of reference. However, since a recent SURVEY article[2] on corporate profits used the corporate gross product framework, the discussion here will be in the same terms.

The first chart clearly indicates that in the postwar period the rate of increase of corporate earnings, depicted by the solid line, has fallen relative to that of corporate gross product, the dotted line. This relative decline is summarized in the downward movement of the ratio of corporate earnings to corporate gross product depicted by the dashed line in the second chart. For instance, in 1948, corporate earnings were 21.3 percent of corporate gross product; this percentage increased 0.9 points to a high in 1950 (during the Korean War) and then declined to a low of 14.4 in 1962. A similar pattern would emerge if 1947 or 1949 were used for the initial year of the comparison rather than 1948, and if 1959, 1960 or 1961 rather than 1962 were the terminal years.

In the longer run also—from 1929 to 1962—the growth of corporate gross product exceeded that of corporate earnings. Over 19 percent of corporate gross product was accounted for by profits in 1929, whereas this was reduced by 5 points in 1962. The qualifications relating to the 1929 comparisons will not be repeated.

Profits before depreciation

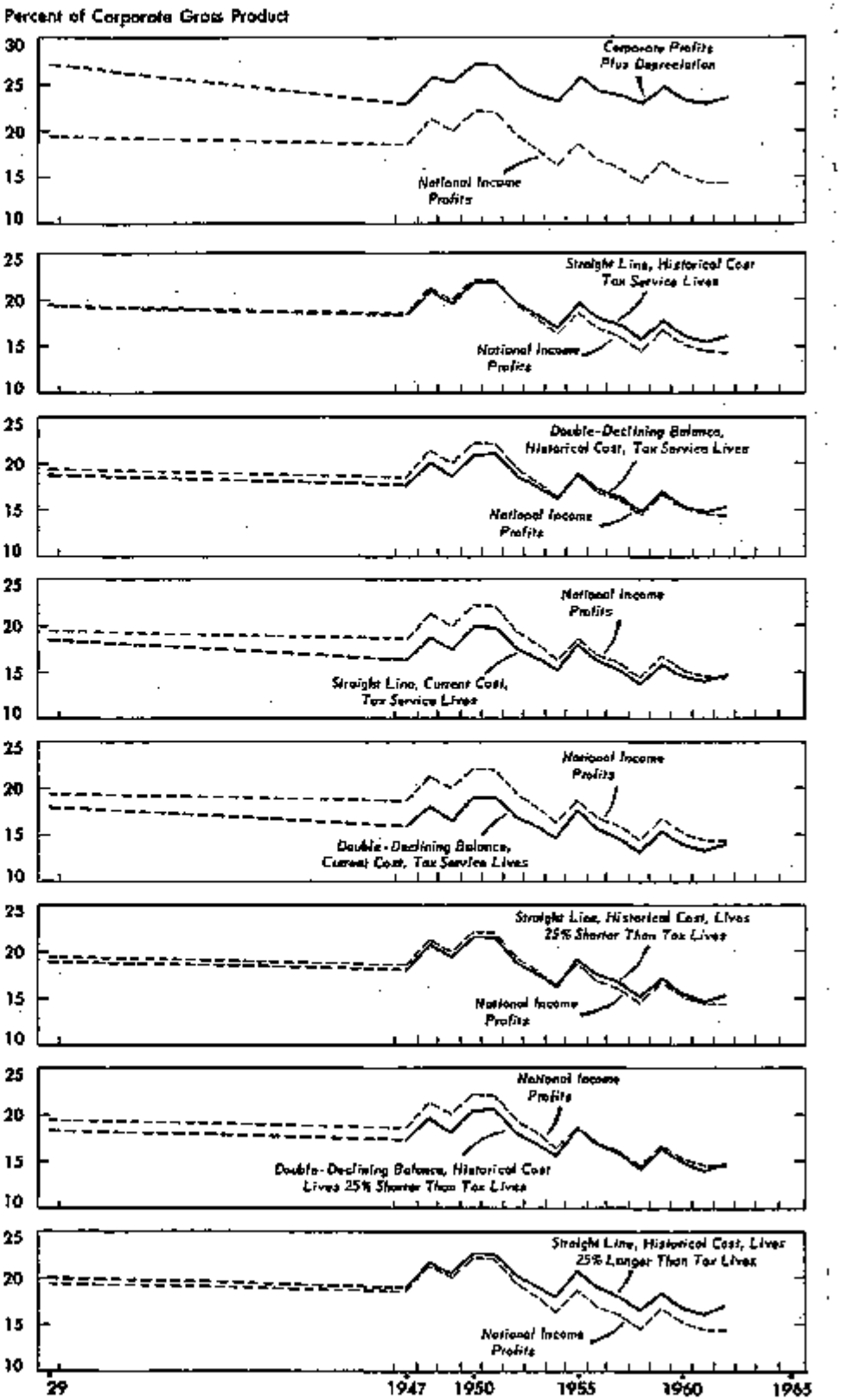
The relative fall in corporate earnings, especially in the postwar period, has been associated with a rapid increase in depreciation charges. Capital consumption allowances, whose major component is depreciation, increased at an average annual rate of 6.1 percent in the period 1929–62; from 1948 to 1962, this rate was 10.5 percent—considerably larger than the 5.7 percent annual increase in corporate gross product in the same period.

As is pointed out in the SURVEY article by Graham and Bauman to which reference has been made, the large increase in capital consumption allowances in the postwar period can be explained by several factors: Capital stocks grew more rapidly than output

2. Robert E. Graham, Jr. and Jacquelin Bauman, "Corporate Profits and National Output," SURVEY OF CURRENT BUSINESS, November 1962. Some of the conclusions of this article are repeated as background in the present study.

CORPORATE PROFIT SHARE UNDER ALTERNATIVE DEPRECIATION METHODS

All Variants of Corporate Profits Before Taxes* as a Percent of Corporate Gross Product Decline



* Including corporate inventory valuation adjustment and excluding corporate profits originating in rest of the world

U.S. Department of Commerce, Office of Business Economics. 63-10-6

during the postwar period, and comparatively shortlived equipment, which carries a high annual depreciation quota, increased relative to structures, which have longer service lives and consequently lower annual depreciation.

Also, the large postwar additions to the capital stock were at prices considerably higher than those embodied in the stock that was subject to depreciation at the beginning of the period. As the older stock was replaced by new items, depreciation charges rose, reflecting the higher postwar price levels.

Finally, changes in the tax laws and regulations further contributed to the rapid growth in depreciation allowances in the postwar period. These changes consisted in the provision of certificates of necessity which permitted the accelerated amortization of defense facilities during World War II and the Korean War; the authorization for tax purposes of accelerated methods of depreciation for new investment by the Revenue Act of 1954; and the promulgation of the DEPRECIATION GUIDELINES of 1962 which effected a broad reduction of service lives for tax purposes.

It is apparent that an economic interpretation of a profit series based on depreciation charges so measured is difficult. However, one may abstract from these charges by examining corporate profits before deduction of depreciation.

Corporate profits plus total depreciation allowances rose from $13.8 billion in 1929 to $72.7 billion in 1962. For the overall period, the percentage of corporate gross product accounted for by corporate profits and depreciation fell by 3.6 points. In the postwar period, 1948 to 1962, this percentage declined from 25.8 to 23.6, which is one-half of the decline in the share of national income profits in the corporate gross product.

Thus, even with depreciation allowances added back, profits were reduced relative to corporate gross product. This implies that the depreciation accounting underlying the national income calculations is not responsible for all of the observed reduction of the profits share.

However, this is not a complete analysis. Depreciation charges should be deducted to arrive at a meaningful measure of profits. We shall accordingly examine the levels and trends of corporate profits under alternative methods of depreciation accounting.

Corporate profits adjusted for legal changes

The first alternative measure of profits that will be examined is based upon depreciation charges that have been adjusted to eliminate the effects of the major changes in the tax laws and regulations that have just been enumerated.

Elimination of the effect of these changes from the depreciation estimates used for tax purposes converts these into straight line historical cost depreciation series with service lives as actually used. These service lives are hereafter referred to as tax lives. This method, which is the simplest and most straightforward one, writes off the original cost (to the last buyer) of the capital asset in equal installments over its estimated service life.

The adjustments that we have been able to make do not eliminate all effects of changes in the tax law and its administration. Less important changes in legislation have not been taken into account. Nor have changes in enforcement procedures that have occurred during the period. In particular, enforcement was tightened in the early 1930's and probably resulted in some decrease in recorded depreciation charges.

From 1952 to 1962, the profit series adjusted as indicated above is higher in level than the profit component of the national income accounts. Corporate profits would have been slightly higher in 1948 in the absence of the legal changes that have liberalized depreciation procedures for tax purposes. In 1962, they would have been $5.2 billion higher than the profits calculated in the national income accounts. But the salient longterm and postwar movements persist. Specifically, adjusted profits as a percentage of corporate gross product fell 3.4 points over the overall period and declined by 5 points from 1948 to 1962. However, the relative decline was not quite so large as in the national income version of the profits share.

Corporate profits with double-declining balance depreciation

There is a significant body of opinion which holds that the value of a capital asset declines at approximately a constant rate throughout its service life rather than by a constant amount as under the straight line method. According to this view the dominant component of depreciation is obsolescence. This is assumed to progress at a constant percentage rate so that the absolute decline in the value of the existing capital is greater in the earlier than in the later part of its service life.

There are several depreciation formulas that produce an accelerated write-off of fixed assets. Two of these are the sum-of-the-years-digits method and the double-declining balance method, both of which were authorized for tax purposes in 1954. The declining balance formula is the more frequently used of the two methods. In the

Table I.—Corporate Profits[1] Under Alternative Depreciation Formulas and Corporate Gross Product, 1929, 1948, and 1962

	Percent of corporate gross product			Absolute value, 1962 (billions of $)
	1929	1948	1962	
Corporate profits, national income version	10.5	21.3	14.4	44.4
Corporate profits plus depreciation, national income version	27.2	25.8	23.6	72.7
Corporate profits based on alternative methods of depreciation:				
Straight-line, historical cost, tax lives	19.5	21.1	16.1	49.6
Double-declining, historical cost, tax lives	18.8	20.1	15.3	47.2
Straight line, current cost, tax lives	18.6	18.8	14.5	45.0
Double-declining, current cost, tax lives	18.1	18.1	14.1	43.4
Straight line, historical cost, 25 percent shorter than tax lives	19.0	20.8	15.4	47.3
Double-declining, historical cost, 25 percent shorter than tax lives	18.3	19.6	14.7	45.2
Straight line, historical cost, 25 percent longer than tax lives	20.1	21.6	16.7	51.4

1. Including corporate ia.

Source: U.S. Department of Commerce, Office of Business Economics.

present section, the effect on corporate profits of employing the declining balance method is examined. The double-declining balance method computes the annual depreciation charge by applying a constant percentage to the undepreciated part of the investment in the year in which the computation is made. Specifically, a percentage which is twice the straight line rate is used.

A profit series based on the double-declining balance formula, historical cost valuation, and service lives used for tax purposes has been computed, and is presented in table 2. The movement in this profit variant corresponds closely to that of the national income profit series; the difference between the two does not exceed $2 billion except in 1962, the year that *Guidelines* was introduced. In the terminal year, double declining profits were $2.8 billion higher than the national income variant. Both series rise rapidly after World War II, but after the early 1950's their rates of growth begin to taper.

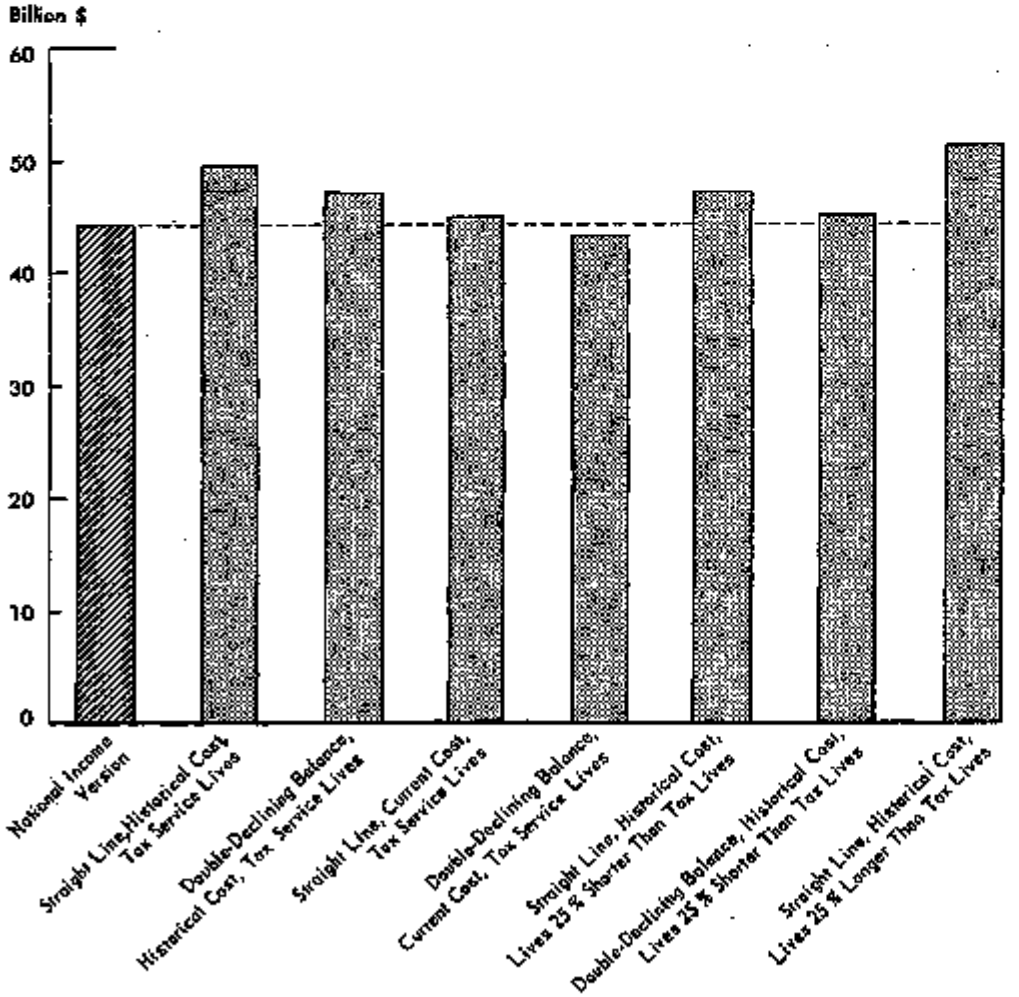
In 1955, the corporate profits based solely on the double-declining balance method began to exceed the national income version. The double-declining profit series had begun to catch up prior to 1955 with the national income profit series. In addition, there were large increases in depreciation based on the use of certificates of necessity in 1955; these tended to raise depreciation allowances above the normal straight line rates. Coupled with the authorization to use double-declining balance and sum-of-the-years-digits methods in 1954, the reported depreciation allowances used for national income purposes for the first time exceeded those computed on the basis of the double-declining balance formula alone.

Just as with all profit variants discussed so far, the share in corporate gross product of profits based on double-declining balance depreciation has fallen since 1929 and especially in the postwar period. However, the decline—from 18.8 percent in 1929 to 15.3 percent in 1962—is slightly smaller than the 5.1 point fall for the same period in the national income profits share of corporate gross product.

A profit series based on the triple-declining balance formula was also computed but is not shown. The level is lower than either the double-declining balance or the national income profit series. This was to be expected, since as long as investment is growing, triple-declining depreciation allowances tend to exceed double-declining depreciation, which in turn tend to be greater than straight line depreciation.

MEASURES OF CORPORATE PROFITS UNDER ALTERNATIVE DEPRECIATION METHODS, 1962*

National Income Measure of Profits Before Taxes Occupied Lower End of Range of Alternative Estimates



* Including corporate inventory valuation adjustment and excluding corporate profits originating in rest of the world

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The problem of the valuation of assets[3]

Aside from the difficulty of choosing a depreciation formula, there is the problem of valuing fixed assets for depreciation purposes.

All of the profit series presented so far are based on depreciation charges that, calculated over the service life of an asset, equal its original cost. Such depreciation charges fall short of (exceed) the replacement cost of used-

3. It is no easy task to apply the current cost criterion either at the firm level or in the national income accounts, and it is important to understand the nature of the measures that in practice can be constructed. Briefly, the conventional procedures for calculating current-cost depreciation overstate the amounts needed to replace the used-up machinery and equipment by items of equal productive capacity. This is so because these procedures set aside resources sufficient to replace the items used up by identical items. But in fact these resources will be used to produce new and improved items that have a higher productive capacity. In the case of structures there is also overstatement for another reason if the procedures for revaluing depreciation rely upon the generally available construction cost indexes. These indexes measure the change in the cost of raw material and labor, and their use in converting depreciation to a current-cost basis sets aside the funds necessary to purchase the same quantity of labor and materials that was employed in the construction of the buildings or factories that have been used up. To the extent that the efficiency of labor and materials has increased over the period, the funds set aside will be more than sufficient to maintain productive capacity. These points are discussed with reference to the measurement of gross capital stocks by George Jaszi, Robert C. Wasson, and Lawrence Grose in "Expansion of Fixed Business Capital in the United States", SURVEY OF CURRENT BUSINESS, November 1962.

up items if capital goods prices rise (decline) during the period in which the asset is being written off. An alternative is to calculate depreciation in terms of current costs. This method is advocated on the ground that it sets aside funds equaling the current replacement cost of the used-up items.

The profits that would have resulted for 1929 and the postwar period had firms used straight line depreciation, tax service lives, and valued the depreciation of their assets in terms of current cost are shown in table 2. They trace out the by now familiar pattern—a sharp rise in the immediate postwar period and then a reduction in their rate of growth. However, this series is lower than the national income version of corporate profits except for 1962.

In other words, even though the national income profit estimates included the effect of the extra depreciation due to accelerated amortization of defense facilities, and the 1954 tax law and administrative changes, depreciation charges would have been still larger, and profits correspondingly smaller, had current-cost depreciation based on the application of the straight line formula to normal lives before the introduction of *Guidelines* been used. When prices are rising, revaluation increases depreciation charges as compared with historical cost depreciation—just as the extra depreciation due to the tax and administrative measures taken, augmented charges over the standard straight line writeoff. In the period under review, the effect of using current cost depreciation would have been larger than was the effect of the various liberalization measures that were introduced. It was not until 1962, when *Guidelines* was introduced, that these relationships were reversed.

Relative to corporate gross product, the straight line revalued profits fall less from 1948 to 1962 than does the national income version. The same pattern is observed if revalued profits are compared with original cost profits for any given depreciation formula.

Corporate profits under different service lives

The versions of corporate earnings discussed so far have been based on service lives which are thought to approximate those used for tax pur-

Table 2.—Corporate Profits Before Taxes* Under Alternative Depreciation Formulas and Corporate Gross Product, 1929 and 1947–62
[Billions of Dollars]

	1929	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
Corporate profits, national income version	9.9	32.6	30.0	27.4	34.7	39.7	36.6	36.2	32.3	41.6	42.2	39.7	36.4	45.4	42.6	41.4	44.4
Percent of corporate gross product	19.5	18.6	21.2	20.0	22.2	22.0	19.4	17.9	16.3	18.0	16.9	16.0	14.5	16.7	15.1	14.5	14.4
Corporate profits plus depreciation, national income version	13.8	23.2	36.3	34.0	42.3	48.3	47.0	48.2	46.0	57.5	57.7	59.0	56.0	67.2	66.3	65.3	72.7
Percent of corporate gross product	27.2	22.9	25.8	25.2	27.2	27.1	24.9	23.2	22.3	25.3	24.3	23.7	23.0	24.7	23.2	23.0	23.6
Corporate profits based on alternative methods of depreciation:																	
Straight line, historical cost, tax lives	9.0	23.6	29.7	27.1	34.4	39.5	38.9	37.0	33.7	44.0	43.0	43.0	38.5	49.4	46.4	44.2	49.0
Percent of corporate gross product	19.5	18.4	21.1	19.7	22.0	22.0	19.6	18.3	17.0	19.7	18.1	17.3	15.5	17.3	16.1	15.5	16.1
Double-declining, historical cost, tax lives	9.5	21.3	28.3	25.5	32.7	37.5	35.1	35.2	32.0	42.4	41.1	40.7	36.3	46.2	42.1	41.9	47.2
Percent of corporate gross product	18.8	17.3	20.1	18.6	20.9	21.0	18.6	17.4	16.2	19.0	17.3	16.4	14.9	17.0	15.3	14.7	15.5
Straight line, current cost, tax lives	9.5	20.2	26.5	23.9	31.2	35.6	33.0	33.1	30.0	40.2	38.5	37.8	33.2	43.1	40.7	39.9	45.0
Percent of corporate gross product	18.9	16.4	18.8	17.4	19.9	19.8	17.5	16.4	15.2	18.0	16.2	15.2	13.7	15.8	14.5	14.0	14.6
Double-declining, current cost, tax lives	9.3	19.7	25.5	22.7	30.1	34.4	31.9	33.0	29.1	39.3	37.4	36.3	31.6	41.8	38.3	38.4	43.4
Percent of corporate gross product	18.1	16.0	18.1	16.5	19.2	19.1	16.9	16.5	14.7	17.6	15.7	14.6	13.1	15.4	14.0	13.4	14.1
Straight line, historical cost, 25% shorter than tax lives	9.7	22.3	29.2	26.6	33.8	38.7	36.7	35.8	32.2	42.7	41.8	41.8	36.9	46.6	43.4	42.0	47.3
Percent of corporate gross product	19.0	18.1	20.8	19.4	21.6	21.5	18.9	17.5	16.3	19.1	17.6	16.7	15.1	17.1	15.4	14.7	15.4
Double-declining, historical cost, 25% shorter than tax lives	9.3	21.3	27.6	24.8	32.0	36.9	33.9	33.8	30.7	41.1	39.9	39.3	34.7	44.6	41.6	40.1	45.2
Percent of corporate gross product	18.3	17.3	19.6	18.0	20.4	20.5	18.0	16.7	15.5	18.4	16.8	15.8	14.2	16.4	14.9	14.0	14.7
Straight line, historical cost, 25% longer than tax lives	10.2	23.2	30.4	28.1	35.6	40.8	38.2	38.5	35.5	46.0	45.0	44.8	40.1	49.9	47.0	45.8	51.4
Percent of corporate gross product	20.1	18.9	21.6	20.4	22.7	22.6	20.2	19.0	17.9	20.6	19.0	18.0	16.5	18.3	16.7	16.0	16.7
Corporate gross product	50.8	123.0	140.7	137.8	156.5	180.2	188.8	202.4	197.8	223.2	237.3	248.7	243.6	272.1	281.2	285.6	307.9

Table 3.—Corporate Profits After Taxes* Under Alternative Depreciation Formulas and Corporate Gross Product, 1929 and 1947–62
[Billions of Dollars]

	1929	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
Corporate profits, National income version	8.3	21.7	17.5	17.0	20.8	17.3	17.1	10.0	15.1	19.7	19.0	18.6	16.7	22.2	20.3	19.4	22.3
Percent of corporate gross product	16.7	9.5	12.4	12.4	13.7	9.6	9.1	7.0	7.6	8.8	8.0	7.0	6.9	8.2	7.2	6.8	7.2
Corporate profits plus depreciation, income version	12.4	10.9	23.8	24.2	28.7	26.4	27.5	26.0	28.8	35.7	36.5	33.1	37.4	44.1	42.5	43.8	50.5
Percent of corporate gross product	24.4	13.7	16.8	17.6	15.8	14.7	14.6	12.8	14.6	16.0	15.4	13.3	15.4	16.2	15.1	15.3	16.4
Corporate profits based on alternative methods of depreciation:																	
Straight line, historical cost, tax lives	8.5	11.3	17.2	16.7	19.5	17.2	17.4	16.6	16.5	22.2	21.8	22.1	19.9	25.2	23.1	22.2	27.4
Percent of corporate gross product	16.7	9.2	12.2	12.2	12.5	9.6	9.3	8.2	8.3	9.9	9.2	8.9	8.2	9.3	8.2	7.8	8.9
Double-declining, historical cost, tax lives	8.1	10.5	15.8	15.1	14.8	15.4	15.6	14.0	14.8	20.6	19.9	19.8	17.8	23.0	20.8	19.9	25.0
Percent of corporate gross product	15.9	8.5	11.2	11.0	9.5	8.5	8.3	7.4	7.5	9.2	8.4	8.0	7.3	8.5	7.4	7.0	8.1
Straight line, current cost, tax lives	8.1	8.0	14.0	13.3	12.3	13.2	12.5	12.0	12.9	18.4	17.3	16.9	14.7	19.9	18.4	17.9	22.5
Percent of corporate gross product	15.9	7.2	10.0	9.8	8.5	7.3	7.3	6.4	6.8	8.2	7.3	6.8	6.0	7.3	6.5	6.3	7.4
Double-declining, current cost, tax lives	7.8	8.4	13.0	12.3	12.2	12.0	12.4	11.8	11.9	17.4	16.2	15.4	13.2	18.6	17.0	16.4	21.2
Percent of corporate gross product	15.4	6.8	9.2	9.0	7.8	6.7	6.6	5.8	6.0	7.8	6.8	6.2	5.4	6.8	6.0	5.7	6.9
Straight line, historical cost, 25% shorter than tax lives	8.3	11.0	16.7	15.2	15.0	16.3	16.2	15.4	15.0	20.9	20.5	20.7	18.3	23.4	21.1	20.0	25.1
Percent of corporate gross product	16.3	8.9	11.9	11.0	10.2	9.0	8.6	7.6	7.6	9.4	8.7	8.3	7.5	8.6	7.5	7.0	8.2
Double-declining, historical cost, 25% shorter than tax lives	7.9	10.0	15.1	14.4	14.1	14.5	14.4	13.7	13.5	19.3	18.7	18.4	16.1	21.4	19.2	18.1	23.0
Percent of corporate gross product	15.6	8.1	10.7	10.5	9.0	8.1	7.6	6.8	6.8	8.6	7.9	7.4	6.6	7.9	6.8	6.3	7.5
Straight line, historical cost, 25% longer than tax lives	8.8	11.6	17.9	17.7	17.6	18.4	18.7	18.3	18.3	24.2	23.8	23.6	21.5	26.7	24.7	23.8	28.2
Percent of corporate gross product	17.3	9.4	12.7	12.9	11.2	10.2	9.9	9.0	9.3	10.8	10.0	9.6	8.8	9.8	8.8	8.3	9.2
Corporate gross product	50.8	123.0	140.7	137.8	156.5	180.2	188.8	202.4	197.8	223.2	237.3	248.7	243.6	272.1	281.2	285.6	307.9

*Including corporate inventory valuation adjustment and excluding corporate profit originating in the rest of the world.
Source: U.S. Department of Commerce, Office of Business Economics.

poses prior to the introduction of *Guidelines*. Alternative assumptions concerning service lives can now be examined.

Table 2 presents a corporate profits series based on straight line depreciation, historical cost valuation and service lives 25 percent shorter than tax lives. From 1929 to 1954, the absolute level of this profit variant tends to be lower than the national income version, but after 1954 it exceeds it. In 1962, the difference between the two variants is $2.9 billion.

The standard pattern of decline in relation to corporate gross product is observable in this series also. It is somewhat more pronounced than in the straight line historical cost series based upon tax lives.

Profit series for lives 25 percent shorter than tax lives have been calculated also for corporate profits based upon all the versions of depreciation formula and valuation procedure hitherto discussed—straight line and double-declining formula and historical and current cost valuation. These variants of corporate profits, which are not shown in the table, all exhibit the typical pattern of decline in relation to corporate gross product that we have observed hitherto. In general the retardation is somewhat larger under the shorter service life assumption than under the tax life assumption.

Although recent legal and administrative changes affecting depreciation charges for tax purposes have been in the direction of shortening service lives, it is interesting to see what the level and trend of corporate profits would have been had longer service lives been used. In table 2 corporate earnings have been computed using straight line depreciation historical cost valuation and service lives 25 percent longer than those underlying tax lives prior to the introduction of *Guidelines*. As would be expected, this results in higher levels of profit than are obtained under the depreciation methods underlying the national income version—and indeed any other version of depreciation accounting that has been discussed in this article. However, the pattern of retardation in relation to corporate gross product persists in this variant of corporate profits also, but it is somewhat less pronounced than the straight line historical cost variant based upon past practice with respect to service lives for tax purposes.

Table 4.—Corporate Profits (Before and After Taxes)* Under Alternative Depreciation Formulas and Corporate Income Originating, 1929 and 1947–62

[Billions of dollars]

	1929	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
National Income Version:																	
Corporate profits before taxes	9.9	23.9	30.0	27.4	34.7	39.7	36.6	38.2	32.3	41.6	40.3	39.7	35.4	45.4	42.6	41.4	44.4
Percent of corporate income originating	21.9	21.9	24.9	23.7	26.2	25.2	23.1	21.4	19.3	22.5	20.6	19.6	18.1	20.6	18.8	18.3	18.2
Corporate profits after taxes	8.5	11.7	17.5	17.0	16.8	17.3	17.1	16.0	15.1	19.7	19.0	18.8	18.7	22.2	20.3	19.4	22.3
Percent of corporate income originating	18.8	11.2	14.5	14.7	12.7	11.2	10.8	9.5	9.2	10.7	9.7	9.3	9.5	10.1	9.0	8.5	9.1
Corporate income originating	45.2	104.7	120.4	115.5	132.3	153.3	158.5	169.0	163.3	184.2	185.2	202.9	195.8	220.8	226.2	228.0	244.1
Corporate profits and income originating based on alternative methods of depreciation:																	
Straight line, historical cost, tax lives:																	
Profits before taxes	9.0	23.6	29.7	27.1	34.4	39.5	38.9	37.9	33.7	44.0	43.0	43.0	38.6	48.4	45.4	44.2	49.6
Percent of income originating	21.0	21.6	24.7	23.5	26.1	25.8	23.2	21.2	20.5	23.6	21.7	20.9	19.4	21.6	19.8	19.2	19.9
Profits after taxes	9.8	11.2	17.2	16.7	16.5	17.2	17.4	16.2	16.5	22.2	21.8	22.1	19.9	26.2	23.1	22.3	27.4
Percent of income originating	18.8	10.8	14.3	14.8	12.8	11.2	11.0	10.0	10.0	11.9	11.2	10.7	10.0	11.3	10.1	9.6	11.0
Income originating	45.2	104.4	120.1	115.2	132.0	158.2	158.8	169.8	164.7	186.6	193.0	206.2	198.9	233.8	228.0	230.3	249.3
Double-declining, historical cost, tax lives:																	
Profits before taxes	9.5	21.8	28.2	25.5	32.7	37.6	35.1	35.2	32.0	42.4	41.1	40.7	36.2	46.2	43.1	41.9	47.2
Percent of income originating	21.2	21.0	23.8	22.4	25.1	25.0	22.4	21.0	19.6	22.9	21.0	19.9	18.4	20.8	19.0	18.3	19.1
Profits after taxes	8.1	10.6	16.6	16.1	14.8	15.4	15.6	14.0	14.8	20.6	19.9	19.6	17.6	23.0	20.8	19.9	25.0
Percent of income originating	18.1	10.1	13.9	13.8	11.4	10.2	9.9	8.3	9.1	11.1	10.1	9.7	9.0	10.4	9.2	8.7	10.1
Income originating	44.8	103.9	118.7	116.6	130.2	151.2	157.0	168.9	163.0	185.0	190.1	203.9	196.6	221.6	225.7	228.3	246.9
Straight line, current cost, tax lives:																	
Profits before taxes	9.5	20.2	26.5	23.9	31.2	35.6	33.0	33.1	30.0	40.2	36.5	37.3	33.3	43.1	40.7	39.9	45.0
Percent of income originating	21.2	19.8	22.7	21.3	24.2	23.9	21.3	20.0	18.6	22.0	19.9	18.8	17.2	19.7	18.1	17.6	18.4
Profits after taxes	8.1	8.9	14.0	13.5	13.3	13.2	13.6	12.9	13.5	18.4	17.3	16.9	14.7	19.9	18.4	17.9	22.8
Percent of income originating	18.1	8.7	12.0	12.1	10.3	8.8	8.7	7.8	8.0	10.1	8.9	8.4	7.6	9.1	8.2	7.9	9.3
Income originating	44.8	102.0	116.9	112.0	128.8	149.2	154.0	165.9	161.0	182.8	193.5	201.0	193.7	218.5	224.3	226.5	244.7
Double-declining, current cost, tax lives:																	
Profits before taxes	9.2	19.7	25.5	23.7	30.1	34.4	31.9	32.0	29.1	39.3	37.4	36.3	31.8	41.3	39.3	38.4	43.4
Percent of income originating	20.7	19.4	22.0	20.5	23.6	23.2	20.7	19.4	18.2	21.6	19.4	18.2	16.5	19.2	17.6	17.1	17.9
Profits after taxes	7.3	8.4	13.0	12.3	12.2	12.6	12.4	11.3	11.9	17.5	16.2	15.4	13.2	18.0	17.0	16.4	21.2
Percent of income originating	17.5	8.3	11.2	11.1	9.6	8.1	7.2	7.4	9.6	9.4	7.7	6.9	6.8	7.6	7.3	6.7	8.7
Income originating	44.5	101.5	115.9	110.8	127.7	148.0	153.8	164.8	160.1	181.9	192.4	199.9	192.2	217.2	222.9	226.0	243.1
Straight line, historical cost, 25% shorter than tax lives:																	
Profits before taxes	9.7	22.8	29.2	26.6	33.8	38.7	35.7	35.0	32.2	42.7	41.8	41.6	36.9	46.6	43.4	42.0	47.2
Percent of income originating	21.6	21.4	24.4	23.2	25.7	25.4	22.7	21.1	19.7	23.0	21.2	20.3	18.7	21.0	19.1	18.4	19.1
Profits after taxes	8.3	11.0	16.7	16.2	15.9	16.3	16.2	15.4	15.0	20.9	20.6	20.7	18.3	23.4	21.1	20.0	25.1
Percent of income originating	18.4	10.6	14.0	14.1	12.1	10.7	10.3	9.1	9.2	11.3	10.7	10.1	9.3	10.5	9.3	8.7	10.2
Income originating	45.0	104.1	119.6	114.7	131.4	152.2	157.6	168.4	163.2	185.3	196.8	204.8	197.3	222.0	227.0	228.6	247.0
Double-declining, historical cost, 25% shorter than tax lives:																	
Profits before taxes	9.3	21.3	27.8	24.8	32.0	36.9	33.9	33.9	30.7	41.1	39.9	39.3	34.7	44.0	41.5	40.1	45.2
Percent of income originating	20.9	20.7	23.4	22.0	24.7	24.5	21.8	20.5	19.0	22.4	20.5	19.4	17.9	20.3	18.4	17.7	18.5
Profits after taxes	7.9	10.0	16.1	14.4	14.1	14.5	14.4	13.7	13.5	19.3	18.7	18.4	16.1	21.4	19.2	18.1	23.0
Percent of income originating	17.7	9.7	12.8	12.8	10.9	9.6	9.2	8.3	8.3	10.5	9.6	9.1	8.3	11.0	8.5	8.0	9.4
Income originating	44.6	103.1	118.0	112.9	129.6	150.5	155.8	166.7	161.7	183.7	194.9	202.5	195.1	220.0	225.1	226.7	244.9
Straight line, historical cost, 25% longer than tax lives:																	
Profits before taxes	10.3	23.2	30.4	28.1	35.5	40.8	38.2	38.5	35.5	46.0	45.0	44.8	40.1	49.0	47.0	45.8	51.4
Percent of income originating	22.4	22.1	25.2	24.2	26.7	26.4	23.9	22.5	21.3	24.4	22.5	21.5	20.0	22.1	20.4	19.7	20.5
Profits after taxes	8.6	11.9	17.9	17.7	17.6	18.4	18.7	18.3	18.3	24.2	23.8	23.0	21.5	26.7	24.7	23.8	29.2
Percent of income originating	19.3	11.3	14.8	15.2	13.2	11.9	11.7	10.7	11.0	12.8	11.9	11.5	10.7	11.9	10.7	10.2	11.6
Income originating	45.5	105.0	120.8	116.2	133.1	154.4	160.1	171.3	166.5	188.5	200.0	208.0	200.6	225.3	230.0	232.4	251.1

*Including corporate inventory valuation adjustment and excluding profits originating in the rest of the world.

Source: U.S. Department of Commerce, Office of Business Economics.

In the basic calculations, lives 25 percent longer than tax lives have been applied also to the other depreciation formulas and valuation procedures discussed previously in the text. All of these additional variants, which are not shown in this report, exhibit the common pattern of retardation of profits.[4]

Appendix

This appendix outlines the procedures used to derive the profits variants in the article. The national income version of corporate profits is not discussed here since the assumptions and data embodied in it are described elsewhere.[5]

The corporate profits series based on various valuation bases, service lives, and depreciation formulas were obtained by executing the following steps:

1. Series were prepared for (a) total nonfarm, nonresidential capital consumption charges,[6] and (b) corporate depreciation charges, including farms and residences, based on the straight line method, historical-cost valuation, and service lives used for tax purposes. This was done by adjusting the series underlying the national income accounts to eliminate the effects of major legal and administrative changes affecting depreciation accounting: the accelerated amortization of defense facilities authorized in World War II and the Korean War, the permission to use double-declining or sum-of-the-years-digits method in 1954, and the reduction in service lives authorized by *Guidelines* in 1962.

2. From the depreciation variants in The Capital Goods Study[7] a depreciation series for nonfarm, nonresidential structures and equipment which was highly correlated with the series defined in 1(a) was selected. This series was based on the following assumptions: straight line depreciation, historical cost valuation, and service lives 20 percent shorter than Bulletin F lives.

3. Forty-four additional depreciation variants for nonfarm, nonresidential structures and equipment were then selected from The Capital Goods Study. These were based on various combinations of straight line, double-declining and triple-declining balance methods, historical cost and two types of current cost valuation bases, and five different service life assumptions.

4. The ratios of all variants in (3) to the depreciation series defined in (2) were calculated. These ratios cover *nonfarm*, nonresidential depreciation.

5. Each ratio in (4) was then multiplied by the series defined in 1(b). This yielded 44 alternative estimates of corporate depreciation covering all depreciation in the corporate sector. The shortcut procedure implied for corporate farm and residential depreciation is justified by the smallness of these two items.

6. Total corporate depreciation charges, unadjusted for tax changes, were then added back to the corporate profits that are computed for the national income accounts.

7. From the gross corporate profits series in (6) the alternative depreciation series developed in 1(b) and (5) were deducted. This produced 45 alternative profit series, each based on a different set of assumptions concerning the accounting for depreciation charges. Only eight of these are discussed in the text. The others are available for examination.

4. None of the profit variants published in this article corresponds precisely to the series that would emerge if the lives suggested by the Treasury *Guidelines* had been used to calculate depreciation throughout. A comparison of the series based upon current tax practice with those based upon lives 25 percent shorter probably gives the closest approximation that can be found in this report to the effects of *Guidelines* on service lives.

A comparison of corporate earnings based on straight line depreciation, and historical cost valuation reveals a difference of $3.3 billion between the tax service life and the 25 percent shorter than tax lives variants in 1962. A similar comparison between the two service life assumptions for the double-declining balance depreciation method and historical cost valuation yields a difference of nearly $2 billion. These figures cannot be compared directly with the estimates that have been made of the effects of *Guidelines* on reported corporate depreciation and profits. However, they appear to be of the same order of magnitude.

5. U.S. INCOME AND OUTPUT, U.S. Department of Commerce, Office of Business Economics, Washington, D.C., 1958; NATIONAL INCOME, 1954 Edition, A Supplement to the SURVEY OF CURRENT BUSINESS, U.S. Department of Commerce, Office of Business Economics, Washington D.C.; and Robert E. Graham, Jr. and Jacquelin Bauman, *op. cit.*

6. This capital consumption series excludes charges attributable to accidental damage but includes depreciation capital outlays charged to current expense for railroad investment and passenger cars which had not been previously included in the capital consumption series in the national income accounts.

7. This study is described in the article by Fasal, *et al.* to which reference has been made.

Manufacturing Output

(*Continued from p. 4*)

Total new bookings for metal-cutting and forming tools received by machine tool builders have been running well above year-ago levels. From January through August new domestic orders were one-fourth above those in the comparable 1962 period and the highest total for the period since 1957. Backlogs for metal-cutting tools expanded to 5.6 months of shipments at the August rate of deliveries—up from 4.2 at the beginning of the year and 4.1 in August 1962.

Output of freight and passenger equipment—aircraft, motor trucks, ships, and railroad equipment—showed little change through May and then advanced sharply, mainly as a result of a large increase in motor trucks. In nonautomotive equipment lines, overall activity showed little change from January to August. In the case of railroad freight cars, deliveries to Class I railroads in the first 8 months of the year were only slightly above the year earlier period but there was some improvement during the summer months. New bookings for freight cars were 40 percent higher and backlogs, while still very low relative to the late 1950's, also advanced. The prospective increase in shipments is a reflection of the improvement in railroad earnings, which has been underway for the past year or so. Total capital expenditures of railroads this year, it may be noted, are programmed at $1.1 billion, a 25-percent increase over 1962, with the bulk of the rise earmarked for equipment purchases.

In the commercial equipment sector—office, service, and telephone equipment, fixtures and office furniture—output peaked in the summer months of 1962, continued on a high plateau through December, and then tended downward this year to a rate 2 percent under the July 1962 peak. The small reduction in output followed an almost uninterrupted 4-year rise which lifted the commercial equipment index some 60 percent over this period, by far the largest increase in the business equipment sector.

Output of farm machinery, while following an erratic pattern so far this year, has been running well above last year's production. For the first 8 months, output was 14 percent above the same period last year and 10 percent higher than the average for all of 1962.

Current cyclical upturn in perspective

The present cyclical upswing in manufacturing production which began in February 1961 has now extended over a period of 32 months. This is 11 months longer than the entire advance of the 1958–60 upturn and 2 months less than the full 1954–57 expansion. The 1949–53 rise, which encompassed 3 years of the Korean crisis, lasted 50 months. It should be pointed out that within the longer recoveries there have been periods of varying duration during which output remained relatively flat, as was the case in the second half of 1962 and the summer of 1963. The increase in output over the latest 32-month period has amounted to 23 percent. This rise matches the relative advance after 32 months in the 1954–57 upturn but falls short of the rise during the Korean period.